

Gate Drive Method and Apparatus for Reducing Losses in the Switching of MOSFETs

Abstract

Usually, in power converters, the load on a MOSFET is inductive, and the current cannot change rapidly. The drain current is the upper limit of the Miller current, so that if the gate current is larger than the drain current, the gate capacitance will continue to discharge and there can be no Miller shelf. If a parallel capacitor is used with a MOSFET, once the drain voltage starts to rise, the load current divides, placing a new lower limit on the Miller current. To drive a MOSFET with a gate current that exceeds the drain current, the circuit impedances have to be very low, suggesting a new geometry and packaging arrangement for the MOSFET and gate drive. A compatible gate turn off circuit is also disclosed.